Obituary

Setsuro Ebashi (1922–2006)

Professor Setsuro Ebashi, who was a Member of the Japan Academy, Professor Emeritus, University of Tokyo, and Professor Emeritus, National Institute for Physiological Sciences in Okazaki National Research Institutes passed away on the morning of July 17, 2006, at the age of 83. Prof. Ebashi had a stroke six years ago in 2000. Thereafter, however, his health remained relatively stable, and during an international symposium in October 2005, celebrating the 40th anniversary of his discovery of troponin, he delivered a speech in English without a draft, as was his usual style, and impressed the scientists who were assembled from all over the world. His condition suddenly worsened a few days before his passing, which has been a deeply felt loss for his friends and pupils.

Prof. Ebashi was born in Koji-Machi, Tokyo on August 31, 1922. He attended Tokyo Daiichi (first) Middle School, Daiichi (first) High School, and then graduated from Faculty of Medicine, University of Tokyo in 1944. He then served as a naval surgeon, and was detained after the war in Shanghai. He returned to Japan in 1946, and joined Dr. Hiroshi Kumagai, who was his mentor when Ebashi was a medical student. Dr. Kumagai later became Professor of Pharmacology, and then the Dean of the Faculty of Medicine, University of Tokyo. Thus, Ebashi started his career as a scientist in the Department of Pharmacology, University of Tokyo.

After a relatively long time seeking to find his specialization, Ebashi decided to concentrate his research on the regulatory mechanism of muscular contraction in the early 1950s. By this time, he was already almost 30 years old and it seems to be a relatively late start in contrast to the subsequent rapid progress in his research.

Prof. Ebashi first investigated the relaxing factor, which was the granular fraction extracted from skeletal muscles, and in 1957, he began to perceive a relationship between the relaxing factor and calcium ions. However, the laboratory was in poor condition after the war, not being equipped with either an ultracentrifuge or calcium isotope that was necessary to prove his hypothesis. Furthermore, when he obtained a series of chelating agents from Mr. Keihei Ueno, President of Dojindo Laboratories, and compared their calcium-binding activity with their muscle-relaxing activity he could not find any correlation. He was disappointed by these results and tentatively abandoned the idea of calcium being the key substance. When he decided to go abroad to study in Prof. Fritz Lipmann's laboratory of Rockefeller Institute in 1959, he considered changing his research area.

Prof. Lipmann, however, advised Ebashi to continue his research on the muscle. Around this period, Ebashi came across a paper in the library that suggested to him that the correlation between calcium-binding activity and muscle-relaxing activity of the chelating agents should be examined in the presence of magnesium ion. He then re-calculated the relationship between the two activities and as a result found that they correlated exactly. This was an important turning point in his research career, and after that his research proceeded very smoothly. By fully utilizing an ultracentrifuge and calcium isotope, he discovered that the activity of the relaxing factor was due to the removal of calcium ion, and furthermore that an extremely low concentration of calcium ion directly acts on muscle proteins to induce a contractile change. Upon returning to Japan, he discovered troponin, a calcium receptive protein that is essential for the calcium sensitivity of muscle proteins. These results altogether established the calcium theory of the regulation of muscular contraction without any doubt.

Ebashi became a Professor of Pharmacology, Faculty of Medicine, University of Tokyo at the age of only 36. Since 1971, he had been jointly appointed as Professor of Biophysics, Faculty of Science, University of Tokyo. After retiring from the University of Tokyo in 1983, he became Professor, National Institute for Physiological Sciences in Okazaki National Research Institutes, the Director-General of the Na-

Prof. Ebashi at the Rockefeller Institute in 1959.

tional Institute for Physiological Sciences, and then the President of Okazaki National Research Institutes.

He became a Member of the Japan Academy in 1978, served as the Chairman of the Section II and the Secretary-General of the Japan Academy. He also served as Editor-in-Chief of the Proceedings of the Japan Academy, contributing greatly to the development of this journal over many years.

Among the many prizes and honors given to Prof. Ebashi for his achievements were the Imperial Prize and the Japan Academy Prize, Order of Cultural Merit, Grand Cordon of the Order of the Sacred Treasure, International Prize for Biology, a Foreign Member of the Royal Society, London, and a Foreign Associate of National Academy of Sciences, USA.

Finally, I wish to touch upon Prof. Ebashi's charming personality, which I observed within close range of him as one of his pupils. It was rather rare that he instructed his pupils to do some particular experiments or gave them some lessons. Instead, he showed us examples through his own actions. However, he had extraordinary intelligence and stamina. When he performed his experiments with great enthusiasm day after day until past midnight, and completed most of the important parts of his work either alone or together with his wife, Dr. Fumiko Ebashi, we, the pupils, were at a loss and did not know how to follow his ways of research. On the other hand, he wholeheartedly took care of not only his pupils, but also his young friends who came in search of his wisdom and advice. It is also well known that the conversation surrounding Ebashi was extremely enjoyable. I was looking forward, when he becomes less busy, to listening to his unique views about politics, culture and the history of science during the Taisho, Showa and Heisei eras in which he lived. Sorrowfully, these wonderful opportunities are now forever lost. It is regretful that Prof. Ebashi, who was capable of doing anything, was somehow unconcerned about his own health.

I wish to express my deepest sorrow and condolences to his family.

Masanori OTSUKA, M.J.A.

This obituary was translated from the message of condolence in Japanese by M. Otsuka, which was read at the 1003rd General Meeting of the Japan Academy on November 13, 2006.